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Canadian Atlantic Fisheries
Scientific Advisory Committee

CAFSAC Research Document 91/50

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Comité scientifique consultatif des
pêches canadiennes dans l'Atlantique

CSCPCA Document de recherche 91/50

The 1990 Inshore Capelin Fishery in NAFO Div. 3K

by

Brian S. Nakashima and Robert W. Harnum
Science Branch
Department of Fisheries and Oceans
P. O. Box 5667
St. John's, Newfoundland A1C 5X1

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Abstract

Provisional landings of 33,402 t in 1990 in SA2 and Div. 3K were the highest inshore landings reported for this area. The 1990 catch was dominated by the 1986 year-class as four-year-olds (63.8%). Reported discarding was relatively high representing 60% of purse seine and 76% of trap landings. Redfeed levels and lov percentage of females were the main reasons given for discarding in both the purse seine and the trap fisheries. Inability to sell the catch was also of concern for trap fishermen. Catch rates from both the purse seine and trap fisheries were the highest ever indicating high abundance of mature fish in 1990. Fishermen's comments supported this conclusion.

Résumé

Les estimations préliminaires des prises de la pêche côtière de la zone SA 2 + division 3K en 1990 s'établissent à 33 402 t, soit un record pour cette zone. Les poissons de quatre ans, c'est-à-dire de la classe d'âge de 1986, ont dominé les prises (63,8 %). On a déclaré d'importants rejets, représentant 60 % des débarquements capturés à la senne coulissante et 76 % des débarquements capturés au parc en filet. Dans ces deux formes de pêche, les rejets ont été imputés essentiellement au capelan à chair rouge et au faible pourcentage de femelles. Les pêcheurs au parc en filet se sont montrés inquiets des difficultés éprouvées pour écouler leurs prises. Les taux de prises, tant dans la pêche à la senne coulissante que dans la pêche au parc en filet, ont été les plus élevés jusqu'ici, dénotant une forte abondance de poisson adulte en 1990, phénomène que confirment les dires des pêcheurs.

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Introduction

Provisional landings of 33,402 t in NAFO SA2 and Div. 3K by the inshore capelin fishery in 1990 were the highest in the series (Table 1). We provide herein a summary of the 1990 commercial fishery, the age composition of the catch, and an analysis of the research logbooks maintained by fishermen.

Materials and Methods

Commercial samples were collected by fishermen and at fish plants by reliable collectors at the rate of two samples per gear type per week per statistical section in Div. 3K (Fig. 1). From each sample, length, sex, maturity stage were measured on 200 fish and a stratified sample of 2 otoliths per sex per 1/2 cm length was taken for ageing.

In 1990 research logbooks were mailed to 20 purse seine and 50 fixed gear licensed fishermen residing in Div. 3K. Of these fishermen, 16 purse seine and 41 fixed gear logbook records were returned to us in 1990. Ten purse seiners fished only in Div. 3K and six fished in both Div. 3L and Div. 3K. In addition, four purse seine fishermen who reside in Div. 3L fished part of their season in Div. 3K. Therefore logbook records from 20 purse seiners were used in our analysis. Of the 50 fixed gear fishermen, 41 returned logbooks and one did not fish in 1990. Only the records from the 34 fishermen who fished capelin traps were included in this report. The remaining seven fixed gear logbooks were either beach seine records or trap records with incomplete information.

Fishing effort was estimated from research logbook records for both purse seines and capelin traps. Fishing days for purse seines were defined as those days when the vessel was out searching for capelin schools. Similarly fishing days for traps were defined as those days when the trap was fishing. In 1990, 20 trap fishermen fished one trap each, 10 fishermen fished two traps and maintained separate records for each trap fished, and four fishermen fished two traps each and combined the records for both traps into a single logbook. To utilize the records from the four unseparated logbooks we estimated effort by developing an effort adjustment factor based on the effort information contained in the logbooks from the ten fishermen who kept separate records for each of the two traps they fished (e.g. Carscadden et al. 1990). To estimate total fishing days for these traps, the reported fishing days were doubled and multiplied by 0.83 and to estimate total number of hauls, the reported hauls were doubled and multiplied by 0.72. This assumes that the four fishermen who did not separate effort for each trap fished, fished in a manner similar to the aggregate effort of the ten fishermen who had separated their effort for individual traps.

Results and Discussion

The Inshore Fishery

The inshore fishery in Div. 3K was prosecuted by purse seines, capelin traps, and beach seines and has been regulated by quota management since 1982. Quotas by area and gear type are presented in Appendix A. Similar to the 1989 fishery, the quota in 1990 was subdivided into four areas: Notre Dame Bay, White Bay, North White Bay, and Labrador (Fig. 1). Opening dates in 1990 were later than in 1989, most likely due to a monitoring programme which was implemented in 1990 to base the opening of each area on the suitability of female capelin for the Japanese roe market. The fishery in Notre Dame Bay for frozen females opened on June 26, closed on July 2, and re-opened on

July 12 for non-female roe production. The White Bay fishery for frozen females opened on June 28, closed for purse seines on July 4 and for fixed gear on July 7, then re-opened on July 10 and closed July 11 for purse seiners, and re-opened July 18 for non-female roe production. The fishery on the northern White Bay fixed gear quota opened on July 9 and the fishery in Labrador opened on June 27.

Age Composition of the Inshore Commercial Catch

In 1989, 51 samples were collected and processed from commercial landings throughout Div. 3K. Samples were partitioned into 15 purse seine, 10 beach seine, and 26 trap (Table 2). A total of 1610 otolith pairs were read and aged. The number of otoliths collected per sample in 1990 averaged between 30.5 and 33.4 (Table 2) which was considerably lower than the 38.2 to 39.9 otoliths per sample collected in 1989 (Table 8, Carscadden et al. 1990).

Similar to the 1989 catch, the 1990 catch in numbers was dominated by the 1986 year-class which constituted 63.8% of the catch as four-year-olds (Table 3). The 1985 year-class as five-year-olds was relatively weak representing 2% of the female catch and barely present in the male catch. The 1987 year-class as three-year-olds was 34.8% of the 1990 catch.

The 1989 age compositions given last year (Carscadden et al. 1990) have been revised to reflect updated landing statistics for 1989.

Research Logbook Survey

In 1990 redfeed levels (45%) and low percentage of females (31%) were the major reasons reported in purse seine research logbooks for discarding the catch (Table 4). These percentages were comparable to estimates for the 1989 purse seine fishery of 51% for redfeed and 38% for low percentages of females. For trap fishermen in 1990, low percentage of females (30%), inability to sell the catch (29%), and unacceptable redfeed levels (26%) were equally important in not landing the catch (Table 5). Unlike 1989 trap fishermen experienced more problems with redfeed in female capelin in 1990.

Discarding from purse seines in 1990 increased from 1989 levels while discards from traps were the same in both years. If we take reported discards as a percentage of reported logbook landings, then discarding represented 60% of purse seine landings (Table 6) and 76% of trap landings (Table 7). Discard totals include approximately 70 t for traps and 204 t for purse seines which were reported as given away to other fishermen. These are not represented in the percentages given in Tables 4 and 5. One likely reason for the increase in a higher portion of purse seine catches being given away was the introduction of a 50,000 lb trip limit for purse seiners in 1990. Using research logbook reports when fishermen reported the condition of their discards, 85% of trap and 80% of purse seine discards were released alive at sea. The majority of the dead discards from purse seines were fish given away to other vessels. In the analyses shown in Tables 4, 5, 6, and 7 discards are defined as all capelin caught but not landed by the fisherman who caught them and includes both live and dead fish.

Catch/effort (CPUE) data were available since 1981 for purse seine vessels and since 1983 for capelin traps. All CPUE estimates for purse seines were higher than in 1989 (Table 6). The 1990 purse seine CPUE of 21.8 t/day was the highest in the series and the 12.8 t/set was comparable to the highest values observed in 1985 and 1986. In the case of capelin traps, the 1990 CPUE estimate of 10.7 t/day was the highest in the series and the 5.8 t/haul was comparable to the highest previous estimate of 5.9 t/haul calculated in 1987 (Table 7) which was considered anomalous (Carscadden et al. 1988).

Effort by the 20 purse seine vessels in 1990 was higher than the 28 vessels in 1989, however, effort in the trap fishery was reduced by almost 50% compared to 1989 estimates. Purse vessels averaged 6.6 fishing days and made 11.2 sets in 1990 (Table 6). For ten vessels, only a fraction of their total capelin fishing season was spent in Div. 3K while ten vessels fished only in Div. 3K. The number of traps for which we have logbook records has increased. In 1990 48 traps each averaged 6.5 fishing days and were hauled 12.0 times (Table 7) which was considerably lower than in previous years (Carscadden et al. 1990).

If we accept CPUE's as an index of inshore abundance of mature capelin and assume that total catch (i.e. landings + discards) as reported in these research logbooks is more realistic than landings alone, then both purse seine and trap CPUE's indicate that inshore abundance was considerably higher in 1990 than in 1989 and was one of the most abundant years since 1981 (Fig. 2). Comments written in the research logbooks and discussions with inshore capelin fishermen during the collection of the logbooks in August and September supported this perception.

Acknowledgments

We especially are grateful to the fishermen who have diligently reported their fishing activities in these research logbooks. The inshore commercial sampling programme was organized by P. J. Williams. Samples were processed by the technical staff of the Pelagic Fish Section. Otoliths were aged by P. G. Eustace. M. Y. Hynes assisted in the preparation of the manuscript.

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Table 1. Inshore capelin landings (t) by gear, 1978-90.

Year	NAFO Div.	Purse seine	Ring net	Beach seine	Trap	Total
1978	2J	-	-	-	-	-
	3K	-	25	1948	447	2420
	2+3K	-	25	1948	447	2420
1979	2J	-	-	-	-	-
	3K	-	168	461	42	671
	2+3K	-	168	461	42	671
1980	2J	-	-	-	-	-
	3K	-	560	655	139	1354
	2+3K	-	560	655	139	1354
1981	2J	-	-	-	-	-
	3K	-	1000	520	283	1803
	2+3K	-	1000	520	283	1803
1982	2J	-	4	4	-	8
	3K	-	1935	1544	381	3760
	2+3K	-	1939	1548	381	3768
1983	2J	-	-	4	-	4
	3K	2359	-	1062	344	3765
	2+3K	2359	-	1066	344	3769
1984	2J	-	-	1	-	1
	3K	3661	-	2338	1119	7118
	2+3K	3661	-	2339	1119	7119
1985	2J	-	-	1	-	1
	3K	3948	-	835	2584	7367
	2+3K	3948	-	836	2584	7368
1986	2J	-	-	3	-	3
	3K	4222	-	2534	5143	11889
	2+3K	4222	-	2537	5143	11892
1987*	2J	-	-	4	-	4
	3K	3038	-	2141	5625	10804
	2+3K	3038	-	2145	5625	10808
1988*	2J	-	-	2	-	2
	3K	9767	-	3725	13353	26845
	2+3K	9767	-	3725	13353	26847
1989*	2J	-	-	3	304	307
	3K	6608	-	3436	17451	27495
	2+3K	6608	-	3439	17755	27802
1990*	2J	-	-	1	-	1
	3K	9621	-	3590	20190	33401
	2+3K	9621	-	3591	20190	33402

* provisional

Table 2. Summary of the commercial samples collected and aged from the 1999 inshore capelin fishery in Div. 3K.

Gear type	No. of LSM/strat samples	No. otoliths aged (N)	Mean no. otoliths ± SD per sample
Purse seine	15	458	30.5 ± 2.8
Beach seine	10	334	33.4 ± 4.6
Capelin trap	26	818	31.5 ± 3.1
TOTAL	51	1610	

Table 3. Age-compositions (%) of capelin from the inshore commercial capelin fishery, Div. 3K, 1982-90.

	Age				
	2	3	4	5	6
Males					
1982	1.2	92.3	6.3	0.1	0.1
1983	0	47.5	52.5	0	0
1984	0	30.7	68.2	1.1	0
1985	0.6	61.7	34.7	3.0	0
1986	0	59.1	40.4	0.5	0
1987	0	8.7	89.9	1.4	0
1988	0.6	65.8	29.9	3.7	0
1989	+	72.7	27.0	0.3	+
1990	0.1	29.4	70.5	+	0
Females					
1982	0.2	80.0	9.9	7.8	2.1
1983	0	38.0	58.8	3.2	0
1984	1.5	38.0	54.1	6.2	0.3
1985	0.8	55.5	27.1	16.0	0.5
1986	0	62.6	32.1	3.9	1.3
1987	0.2	12.5	76.3	10.4	0.6
1988	3.4	54.3	13.6	27.0	1.7
1989	0.8	66.5	27.2	2.4	3.1
1990	0.3	39.1	58.6	2.0	0
Sexes combined					
1982	1.0	85.0	8.3	4.5	1.3
1983	0	43.3	55.0	1.4	0
1984	0.6	33.4	62.6	3.1	0.1
1985	1.5	57.2	29.5	11.5	0.4
1986	0	61.0	35.8	2.4	0.7
1987	0.1	10.8	82.5	6.3	0.3
1988	1.9	59.5	20.8	16.9	1.0
1989	0.4	69.7	27.1	1.3	1.5
1990	0.2	34.8	63.8	1.1	0

Table 4. Reasons (expressed as % by weight) reported in logbooks for discarding capelin in purse seines in Div. 3K, 1981-90. This analysis excludes capelin given away to other fishermen.

Year	Low % females	Redfeed	Not mature enough	Small females	Females spawned out	No market	Over ripe	Misc.	Unknown
1981	90	6	4	0	0	0	0	0	0
1982	32	52	0	10	6	0	0	0	0
1983	5	48	0	4	0	42	0	0	1
1984	81	4	0	2	8	3	2	0	0
1985	6	52	0	0	5	2	0	33	3
1986	31	36	0	0	4	3	0	26	0
1987	6	78	0	0	0	0	0	10	6
1988	20	39	0	7	0	9	0	20	5
1989	38	51	0	4	0	0	0	6	1
1990	31	45	0	3	2	13	0	3	3

Table 5. Reasons (expressed as % by weight) reported in logbooks for discarding capelin from capelin traps in Div. 3K in 1983-90. This analysis excludes capelin given away to other fishermen.

Year	Redfeed	Females over ripe	No market	Low % females	Males picked out	Females spawned out	Misc.	Unknown
1983	81	0	0	4	1	15	0	0
1984	1	0	17	51	19	4	8	0
1985	19	0	27	28	19	+	2	4
1986	10	16	27	30	7	3	6	0
1987	27	0	37	11	5	0	14	6
1988	19	0	50	14	14	0	2	1
1989	3	0	18	66	12	0	1	0
1990	26	+	29	30	5	0	5	5

Table 6. Capelin landings (t), discards (t), and catch/effort from research logbook records for purse seines in Div. 3K, 1981-90.

Year	No. fishermen	Landings	Discards logbook	No. days fished (D)	No. sets made (S)	L = Landings		C = Landings + discards	
						L/D	L/S	C/D	C/S
1981	10	725.0	92.9	89	118	8.2	6.1	9.2	6.9
1982	8	849.9	188.0	67	109	12.7	7.8	15.5	9.5
1983	14	1097.0	253.2	113	161	9.7	6.8	12.0	8.4
1984	10	928.0	297.1	87	127	10.7	7.3	14.1	9.7
1985	9	1067.2	551.5	98	129	10.9	8.3	16.5	12.6
1986	8	1053.9	310.0	76	110	13.9	9.6	18.0	12.4
1987	6	253.2	219.7	31	61	8.2	4.2	15.3	7.8
1988	16	2300.3	407.8	146	257	15.8	9.0	18.5	10.5
1989	28	1840.4	510.3	141	238	13.1	7.7	16.7	9.9
1990	20	1784.1	1075.8	131	224	13.6	8.0	21.8	12.8

Table 7. Capelin landings (t), discards (t), bycatch (t), and catch/effort from research logbook records for capelin traps in Div. 3K, 1983-90.

Year	No. fishermen	No. traps	Landings	Discards logbook	Bycatch		No. days fished (D)	No. times hauled (H)	L = Landings		C = Landings + discards	
					Cod	Herring			L/D	L/H	C/D	C/H
1983	3	3	85.8	51.3	6.0	24.9	41	48	2.1	1.8	3.3	2.9
1984	6	6	217.0	111.3	2.6	0.1	80	101	2.7	2.1	4.1	3.3
1985	9	9	212.0	209.9	2.8	0	132	123	1.6	1.7	3.2	3.4
1986	14	14	757.6	575.9	3.4	+	229	278	3.3	2.7	5.8	4.8
1987	13	15	355.8	378.4	0.1	0	70	125	5.1	2.8	10.5	5.9
1988	18	20	992.0	532.5	1.5	0	258	423	3.8	2.3	5.9	3.6
1989	28	35	1360.7	1038.1	4.9	0	411	732	3.3	1.9	5.8	3.3
1990	34	48	1893.7	1447.9	2.9	0.1	312	575	6.1	3.3	10.7	5.8

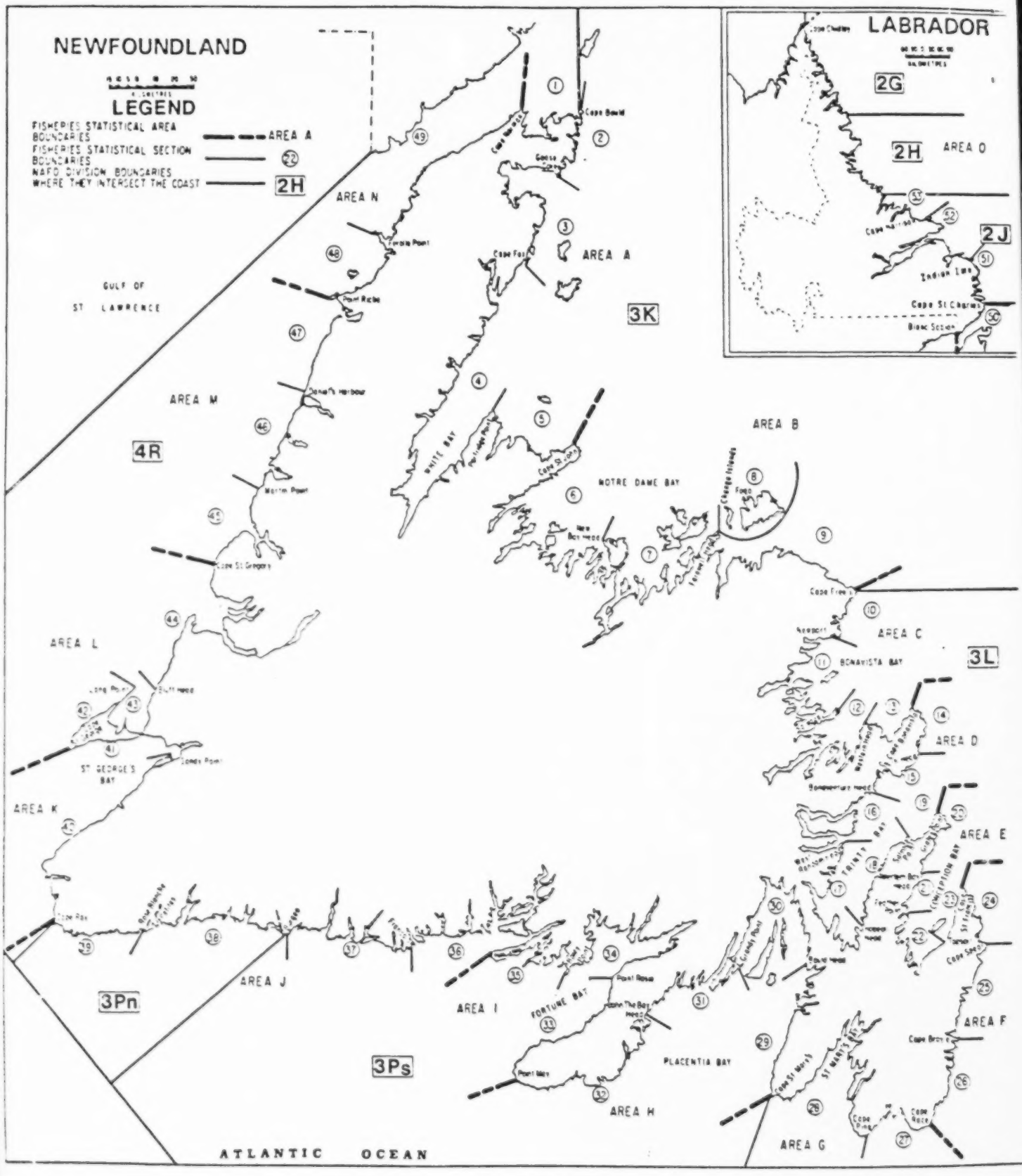

Fig. 1. Statistical area (alphabetic) and sections (numeric) in the Newfoundland Region.

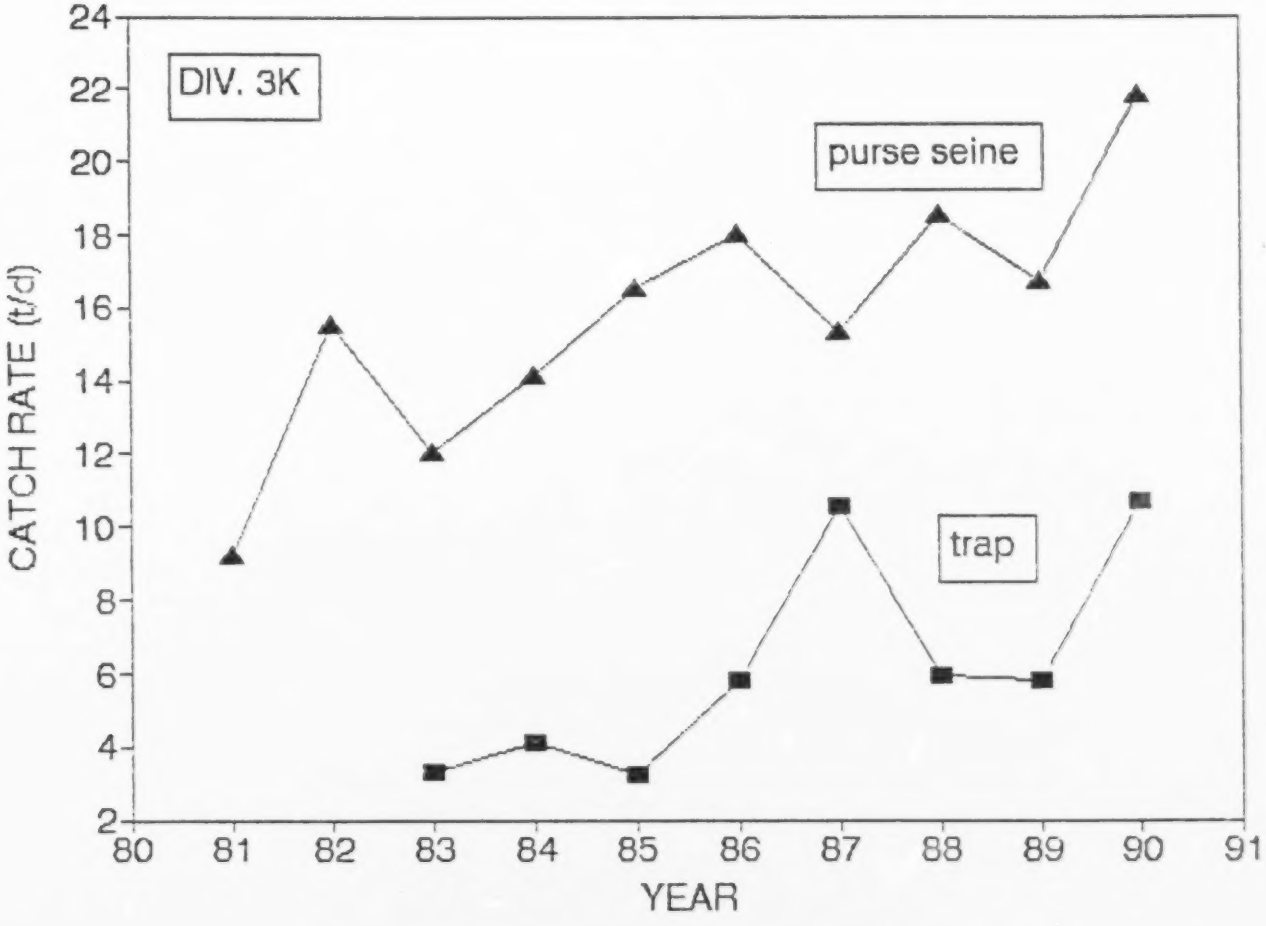

Fig. 2. Catch rates (t/day) for purse seines (▲) and traps (▮) in Div. 3K.

APPENDIX A

Allocation of quotas (t) and opening dates for the inshore commercial fishery in SA2 + Div. 3K.

Year	Area	Fixed gear	Purse seine	Reserve	Total	Product use	Opening date
1982	2J3K	1000	1000	1000	3000	Frozen females	June 1
1983	Notre Dame Bay	1500	1500		3000	Frozen females	June 15
	White Bay	1500	1500		3000	Frozen females	June 15
	2J3K	1000	1000		2000	Roe extraction	June 15
1984	Notre Dame Bay	2500	2500		5000	Frozen females	June 15
	White Bay & Labrador	1500	1500		3000	Frozen females	June 15
1985	Notre Dame Bay	2500	2500		5000	Frozen females	June 28
	White Bay & Labrador	1500	1500		3000	Frozen females	June 28
1986	Notre Dame Bay	5500	5500		11000	Frozen females	June 1
	White Bay & Labrador	4000	4000		8000	Frozen females	June 1
1987	Notre Dame Bay	3300	1700		5000	Frozen females	June 1*
	White Bay & Labrador	2600	1000		3600	Frozen females	June 1*
1988	Notre Dame Bay	8200	3250		11450	Frozen females	June 1
	White Bay & Labrador	5300	3250	1500	10050	Frozen females	June 1
1989	Notre Dame Bay	8500	3500		12000	Frozen females	June 7
	White Bay	7000	3300		10300	Frozen females	June 7
	N. White Bay	1500			1500	Frozen females	June 7
	Labrador	300			300	Frozen females	June 7
1990	Notre Dame Bay	10500	4000		14500		June 26
	White Bay	8500	4000		12500		June 28
	N. White Bay	2000			2000		July 9
	Labrador	400			400		June 27

* fishery began June 19 after agreement on price structure and quotas